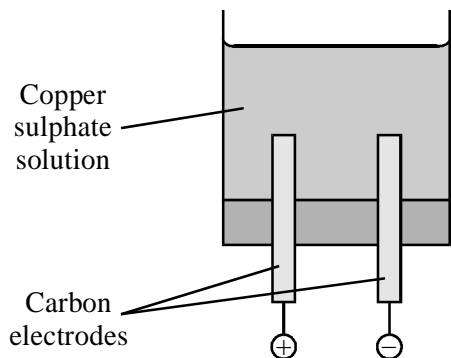


Electrolysis

1. An investigation into the *electrolyte* copper sulphate solution was carried out as shown.



(a) What does *electrolyte* mean?

.....

.....

.....

(2)

(b) These were the observations.

Negative electrode	solid formed
Positive electrode	gas given off

(i) Name the solid formed.

.....

(1)

(ii) Name the gas given off.

.....

(1)

(c) How could a sample of gas be collected at the positive electrode?

.....

.....

(2)

(d) Suggest why the blue colour of copper sulphate becomes paler during the investigation.

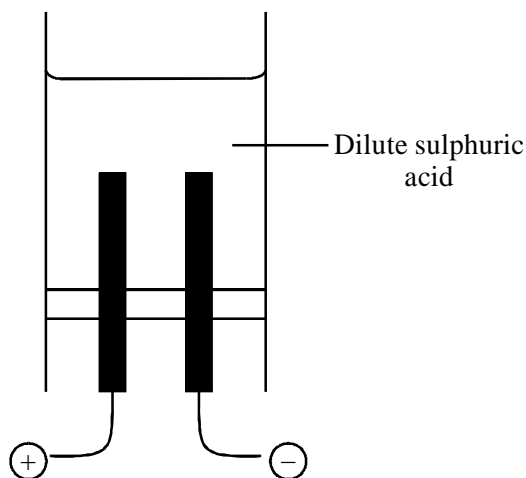
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.....

(2)

(Total 8 marks)

2. An electric current was passed through dilute sulphuric acid. The apparatus used is shown. Oxygen was formed at the anode.

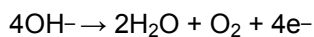


- (a) What name is given to solutions which decompose when electricity is passed through them?

.....

(1)

- (b) The ionic equation for the reaction at the anode is:



Explain this type of reaction.

.....

(2)

- (c) Write a **balanced** ionic equation for the reaction at the cathode.

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(2)

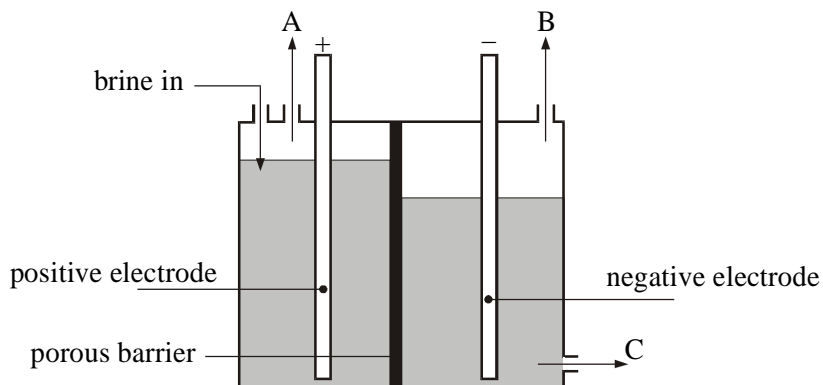
- (d) What happens to the concentration of the sulphuric acid as the electricity is passed through it? Explain your answer.

.....

(3)

(Total 8 marks)

3. Sodium hydroxide, hydrogen and chlorine can all be made in one industrial process. Electricity is passed through aqueous sodium chloride solution (brine). The diagram below shows a cell that can be used for this process.



- (a) Name A, B and C.

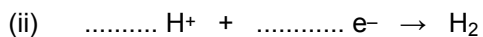
Gas A

Gas B

Solution C

(2)

- (b) Balance the equations for the reactions at the electrodes.



(2)

- (c) Name the compound in this cell which produces the hydrogen ions.

.....

(1)

- (d) Which type of particles must be able to pass through the barrier to allow the electrolysis to take place?

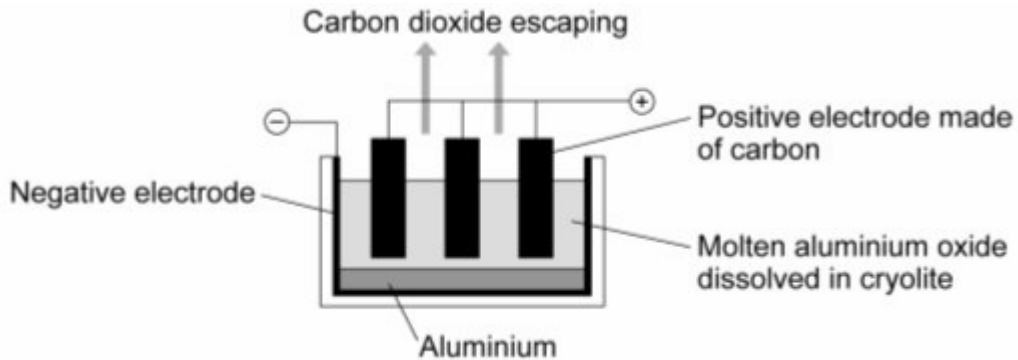
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(1)

(Total 6 marks)

4. Read the information in the box and then answer the question.

Aluminium is made by the electrolysis of aluminium oxide.
 Aluminium oxide is an ionic compound containing aluminium ions (Al^{3+}) and oxide ions (O^{2-}).
 The diagram below shows the apparatus used to electrolyse aluminium oxide.



(a) Use information in the box and your knowledge of this process to answer this question.
 Explain, as fully as you can, how aluminium and carbon dioxide are formed in this process.
In this question you will get marks for using good English, organising information clearly and using scientific words correctly.

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.....

(6)

(b) Aluminium is a metal.
 Explain why it conducts electricity.

.....

.....

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.....

(2)

(Total 8 marks)